# Owner's manual

## ZX-series

ZAPCO

Competition CLASS A/B

**Class A/B Competition SQ Amplifier**

When too much just isn't quite enough

Before operating the unit, please read this manual throughly
and retain it for future reference.

Protect your Investment

Note your information below for reference:

Model #_____ Serial #_____

Date Purchased_____

And: ***Register your Zapco product now***

At: www.zapco.com

# Mission Statement

## Committed to excellence

**Zapco** is dedicated to the pursuit of audio fidelity. Our prime objectives are to design and manufacture audio products of unsurpassed quality, to provide unparalleled support and service for these products, and to conduct business in a manner that will enhance the quality of life for all involved.

## Experience: Knowledge from doing

There is absolutely no substitute for experience; that is a simple fact of life. Another simple fact is that **Zapco** has, for over forty years, been the leader in defining quality standards for the car audio industry. These years of experience have led to a thorough understanding of the challenges that are unique to the world of car audio. **Zapco's** relentless quest for sonic purity consistently yields imaginative designs that utilize the most innovative technologies. The resulting products set the criteria by which all others in the industry are judged.

## The Zapco ZX-Series

The Z-Series of Zapco amplifiers is the result of our experience over the last 40 years with the technology of sound reproduction, combined with what we have learned in consultations with the home and car audiophile communities over the last few years about human perception of sound. We have also used a number of studies of the human physiology to examine what an amplifier should do to make reproduced music sound more like live music.

What did we discover? The proper combination of output devices, op-amps, capacitors and other internal components makes a huge difference in the quality of the sound an amplifier produces. We also determined that with technological advances over the last 10 years we could now develop a more efficient Class D amplifier that would have the SQ specs at 1Ω to equal or even surpass those of most A/B amps.

What we did: We set our standards for specifications in Class A/B and Class D and assured that all amps would meet them. Then we used the best combination of tantalum capacitors, NJM 5532 and OPA 2134 op-amps, and KEC and Sanken high speed bi-polar output devices, and MOSFET output devices for the Class D amplifiers to produce what we believe are the best sounding amplifiers we have ever offered.

The **ZX-Series** takes the Z-Series to a whole new place of extreme performance and ***Crazy*** power

There are two A/B amps in the ZX-Series. One is the 2 Channel ZX-500.2 with 500 watts RMS/channel and over 2,400 watts RMS in a 2 ohm mono bridge. The other is the ZX-200.4 four channel amp. This one is 200Watts RMS/channel x 4 at 4Ω and 1000 watts/ channel x 2 at 2Ω.
Like we say, these are the amps to use when "too much is just not quite enough".

## Read, Use, and Enjoy

Yes, please read this manual thoroughly. We wrote it to help ensure that you get the most from your investment in your Zapco amplifier. If you find, after reading the manual, that you still have questions please feel free to give us a call at 1(800)47-FORCE, or, drop us a note at **www.zapco.com**

## Power and Wire Gauge

The wire you use for the power and ground connections of your amplifier are absolutely critical. The plain simple fact is that it takes power to deliver power. If you do not provide the proper amount of 12V power to your amplifier, you will never reach the full power potential of your amp. Take a look at the chart below. If you want to have any respectable amount of power for your amp, you need an 4-gauge wire to the trunk as a bare minimum. If you are running any Zapco ZX-series amp in you trunk you need at least a 0 gauge wire.

## Recommended Wire Gauge

| Up to | 4 Ft | 7 Ft | 10 Ft | 13 Ft | 16 Ft | 19 Ft | 22 Ft | 28 Ft |
|---|---|---|---|---|---|---|---|---|
| **20 A** | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 8 |
| **35 A** | 12 | 10 | 8 | 8 | 4 | 4 | 4 | 4 |
| **50 A** | 10 | 8 | 8 | 4 | 4 | 4 | 4 | 4 |
| **60 A** | 8 | 8 | 4 | 4 | 4 | 4 | 4 | 2 |
| **85 A** | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 0 |
| **105 A** | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 0 |
| **125 A** | 4 | 4 | 4 | 2 | 2 | 0 | 0 | 0 |
| **150 A** | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |

You can certainly save money by buying cheap small gauge wire, but remember...It will cost you in power and may even damage your car by passing too much current and causing shorts or even fires. Protect your investment in Zapco amplifiers by using high quality, proper gauge wire.

**And remember...** Current in the amplifier runs in a complete circuit from the battery to the amp and back to the battery through the chassis and frame. The ground wire us just as important as the power input wire. **Positive and Negative connections must always use the same gauge wire.**

## Installation Guidelines

Mounting your Reference Amplifier is easy. Keep in mind the following guidelines:

- The amplifier may be mounted in any direction, on wood, metal or carpet. The metal case of the amplifier may be grounded or left isolated.
- The amplifier requires adequate ventilation. Position the amplifier with sufficient surrounding area for proper cooling. Keep fan and vent endplates clear for proper internal cooling.

- Keep the amplifier out of the engine compartment and other locations that may cause excessive heat or moisture.
- Make sure your ground point is at the frame or a chassis point with direct frame contact. Note: the "quiet metal" on many new cars make body panels very bad ground points, so always try to use the frame.
- Do not mount the amplifier to a subwoofer enclosure or any other place that may have excessive vibration!

## Gain Setting

Matching Your Components for Best Sound

Proper gain setting is one of the most important factors in setting up a stereo system. At the same time, gain setting is most often done wrong. Turning up the gain of an amp is the very last thing you should ever do to a system.

An amplifier is a step up transformer. Period. Any signal you put in is boosted by a fixed factor. Music, hiss, or any other noise, it doesn't matter. A large number of noise problems are simply a matter of improper gain settings. The goal of gain setting is to achieve the maximum amount of musical output from the amplifier while getting the least amount of hiss or noise from the system. Your Z-Series Series amplifier accepts an extremely wide range of input levels. As little as . 5 volts on the RCAs to as much as 8 volts. The basic gain setting is very simple and requires no special tools. Whether you have a simple system with a deck and an amp, or a system with a deck, line driver, equalizer, crossover, and amp, the procedure is always the same. First, hook up the system with all gain controls at minimum (turn the gain pot fully counter-clockwise with a small screwdriver). Then turn on the head unit and turn up the volume. If you achieve clean sound, and, more volume than you want, you don't need to make any adjustments. However, if you turn up the volume and begin to hear distorted sound before it becomes loud, you are clipping (distorting) the deck (probably a little over ¾ volume). Turn the deck down just enough to hear clean sound again, and then move to the next component in your system. With the deck playing at "maximum clean volume" adjust the gain of the next component to its "maximum clean volume". If you adjust your gains this way, always starting at the head unit and working down the line to the amplifier, you will get the most performance out of your amplifier(s) with the least amount of unwanted distortion and noise.

**Presenting**
**The Zapco ZX-Series**
**Class A/B Sound Quality Amplifiers**

# FEATURES

## ■ ZX-500.2

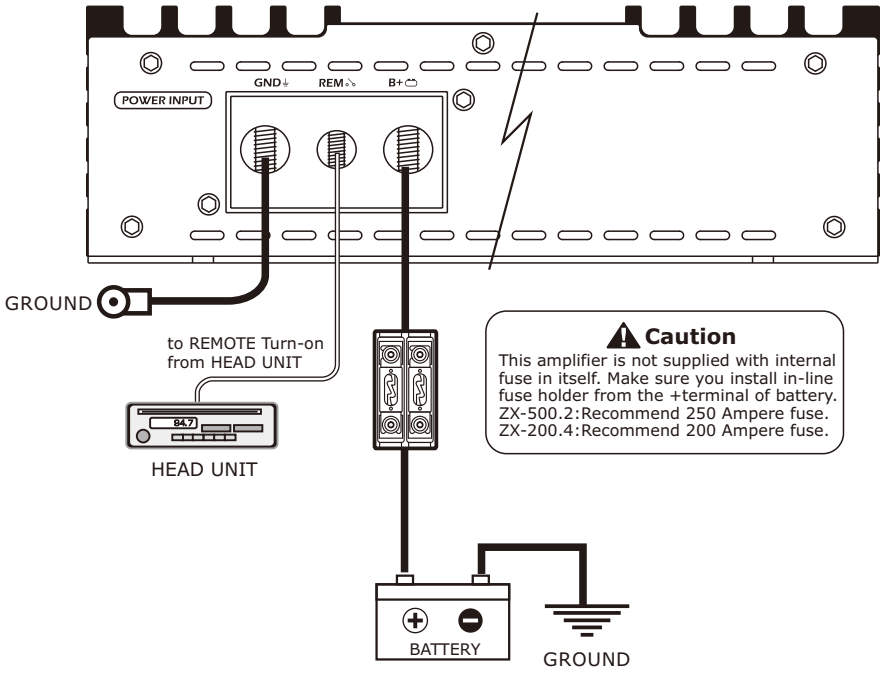
- ■ Class-AB bridgeable car amplifier
- ■ 2/1 channel bridgeable car amplifier
- ■ Stable into 2 ohms bridged or 1 ohm stereo load
- ■ PWM MOSFET power supply
- ■ Input sensitivity (gain) control variable
- ■ 18dB octave crossover slope
- ■ Variable, selectable LP / HP crossover
- ■ Variable bass boost
- ■ Signal input and output RCA connectors
- ■ Multi-way protection circuitry
  (thermal / over current / speaker short / speaker DC protection)
- ■ Tested voltage & THD: 14.4V & less than 0.05% THD
- ■ Operating voltage : DC10V~15.5V power input
- ■ Wired remote control (optional)

## ■ ZX-200.4

- ■ Class-AB bridgeable car amplifier
- ■ 4/3/2 channel bridgeable car amplifier
- ■ PWM MOSFET power supply
- ■ Input sensitivity (gain) control variable
- ■ 18dB octave crossover slope
- ■ Variable, selectable LP / HP crossover
- ■ Variable bass boost
- ■ Signal input and output RCA connectors
- ■ Multi-way protection circuitry
- ■ (thermal / over current / speaker short / speaker DC protection)
  Tested voltage & THD: 14.4V & less than 0.05% THD
- ■ Operating voltage : DC10V~15.5V power input
- ■ Stable into 2 ohms bridged or 1 ohm stereo load
- ■ Wired remote control (optional)

# POWER CONNECTION

## ■ ZX-500.2 / ZX-200.4




**+12V Power**
**Disconnect the battery ground cable.** Connect the +12V terminal of the amplifier to the + terminal of the battery using the same gauge cable for Positive and Negative connections. Install an in-line fuse holder at the battery positive, removing the fuse until all connections are completed.

**GROUND**
**Disconnect the battery** and connect the GND (ground) terminal to the cars frame or chassis with the same gauge wire used for the +12V power connection. Keep this cable as short as possible.
Make sure that the connection point at frame or chassis is rust free and clear of paint or grime.

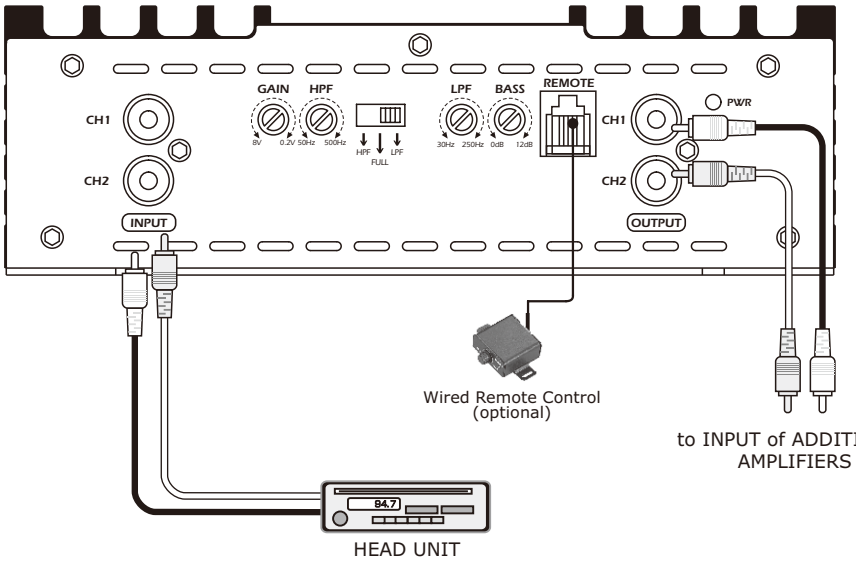
**REMOTE**
Connect the REM terminal of the amplifier to the +12 trigger out of the source unit, or an accessory terminal of the fuse box or ignition switch.

**⚠ Caution**

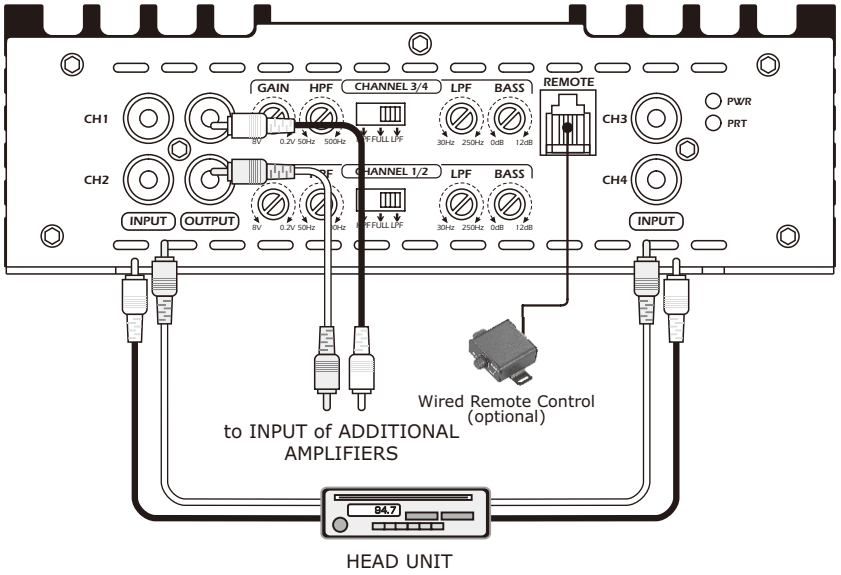
First make the ground connection, then +12V wire connection, and finally the remote connection. The +12V wire must always be fused at the battery for protection against possible damage. If you need to replace the power fuse, replace it with a fuse of the same value.

# RCA CONNECTION

## ■ ZX-500.2




## ■ ZX-200.4

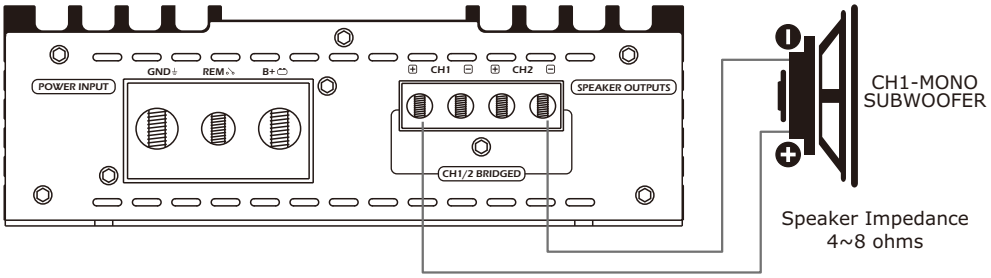



The amplifier has 4 channels of a signal input to connect to the source units output, and 2 pass-through RCA outputs to feed signal to another amplifier. Input Gain adjustments are used to match the amps's input level the the source unit's output level.
See "Gain Setting" earlier in this manual for tips on wetting signal levels for best sound

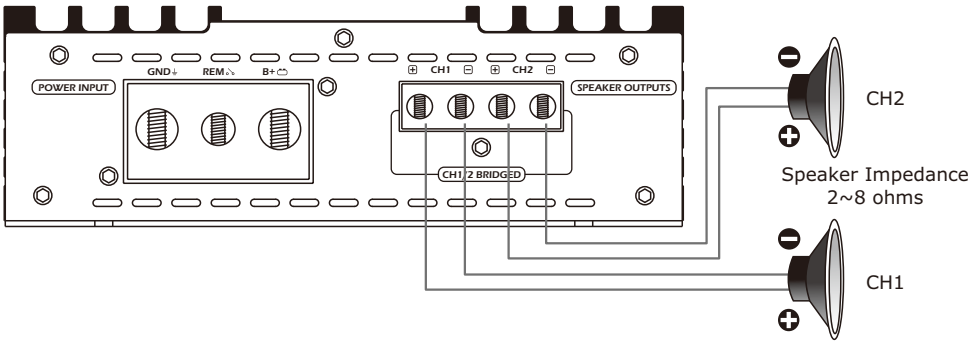
# SPEAKER CONNECTION

## ■ ZX-500.2

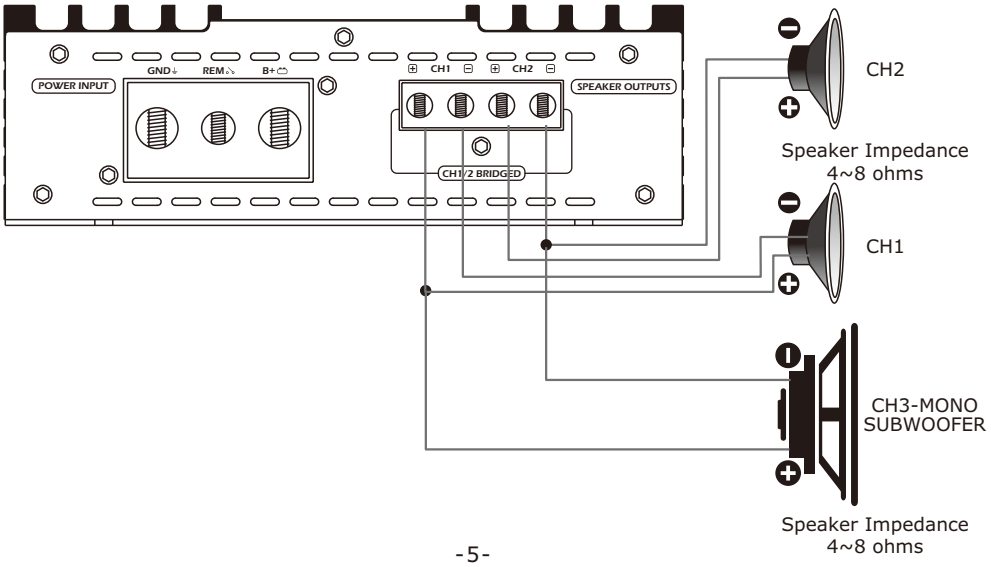
### 1 Channel Bridged




### 2 Channel Stereo




### 3 Channel Tri Mode



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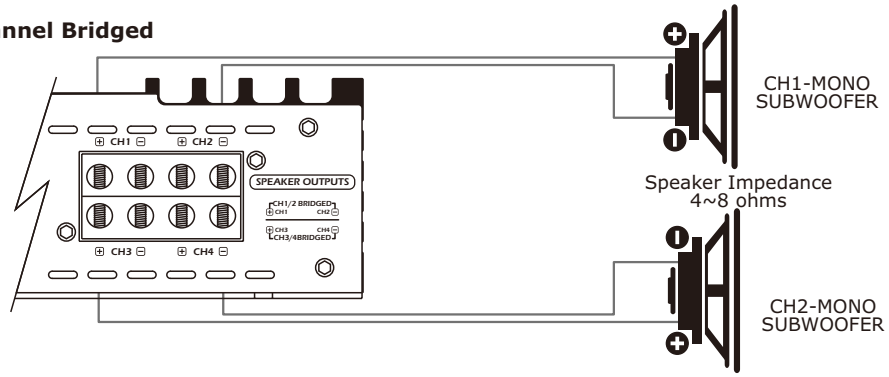
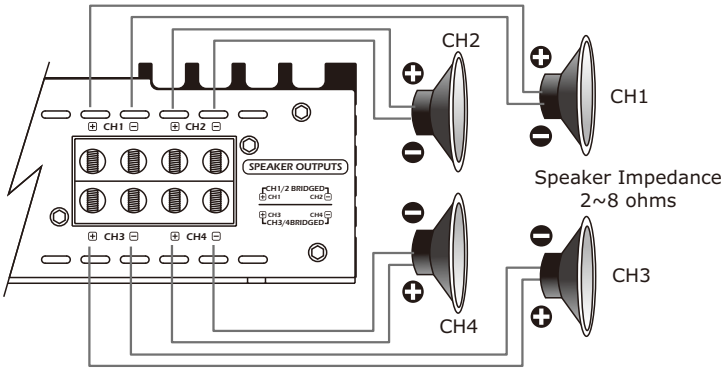
# SPEAKER CONNECTION

## ■ ZX-200.4

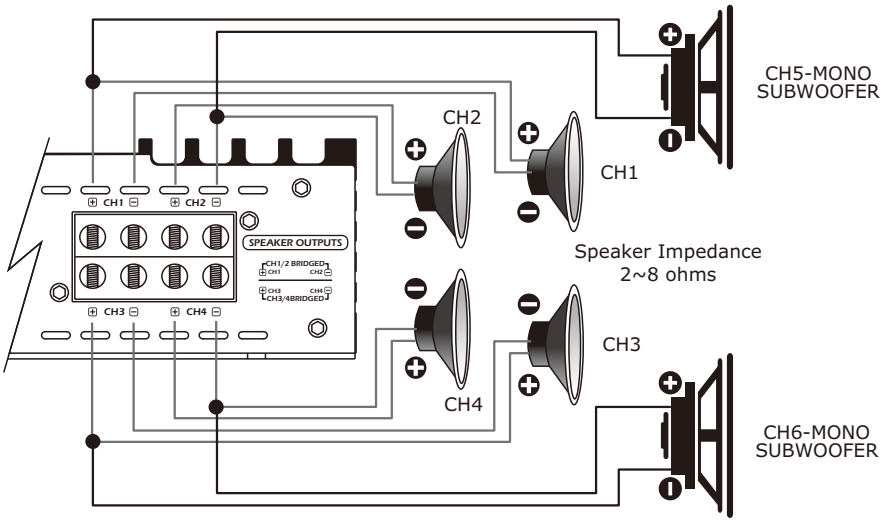
### 2 Channel Bridged




### 4 Channel Stereo




### 6 Channel Tri Mode



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# SPECIFICATIONS

## ■ ZX-500.2

Rated power output

| | |
|---|---|
| -RMS power, 4 ohms stereo | **510W x 2CH** |
| -RMS power, 2 ohms stereo | **840W x 2CH** |
| -RMS power, 1 ohm stereo | **1210W x 2CH** |
| -RMS power, 4 ohms bridged | **1730W x 1CH** |
| -RMS power, 2 ohms bridged | **2440W x 1CH** |
| Signal to Noise Ratio | **>90dB** |
| Low Pass Crossover | **30Hz ~ 250Hz** |
| High Pass Crossover | **50Hz ~ 500Hz** |
| Bass boost @ 45Hz | **0~12dB** |
| Frequency Response | **10Hz ~ 30KHz (+/-1dB)** |
| THD@RMS Watts | **0.1%** |
| Channel Separation | **60dB** |
| Fuse Ratin | **250A**(external type fuse) |
| Input Sensitivity | **200mV~6V (+/- 5%)** |
| Dimensions (mm) | **190(W) x 60(H) x 660(L)** |

## ■ ZX-200.4

Rated power output

| | |
|---|---|
| -RMS power, 4 ohms stereo | **210W x 4CH** |
| -RMS power, 2 ohms stereo | **330W x 4CH** |
| -RMS power, 1 ohm stereo | **490W x 4CH** |
| -RMS power, 4 ohms bridged | **680W x 2CH** |
| -RMS power, 2 ohms bridged | **1000W x 2CH** |
| Signal to Noise Ratio | **>90dB** |
| Low Pass Crossover | **30Hz ~ 250Hz** |
| High Pass Crossover | **50Hz ~ 500Hz** |
| Bass boost @ 45Hz | **0~12dB** |
| Frequency Response | **10Hz ~ 30KHz (+/-1dB)** |
| THD@RMS Watts | **0.1%** |
| Channel Separation | **60dB** |
| Fuse Rating | **200A**(external type fuse) |
| Input Sensitivity | **200mV~8V (+/- 5%)** |
| Dimensions (mm) | **190(W) x 60(H) x 650(L)** |

The above specifications shall be modified by manufacturer for improvement without prior notice.



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# TROUBLE SHOOTING GUIDE

*This power amplifier has protection features to prevent most forms of damage.*
*If the unit senses excessive heat, short circuited speakers or overload, the protection indicators will be lit and the system will be turned off. Prior to checking the wiring for any fault, you should turn all level controls down and turn off power. If the amplifier shuts down due to excessive heat, the protection indicators will not be lit: simply allow the amplifier to cool down.*
*Before removing your amplifier, refer to the list below and follow the suggested procedures.*
*Always test the speakers and their wires first.*

## AMPLIFIER IS NOT POWERED UP

- Check if at least +12V DC is present on the battery power terminal.
- Check if at least +13.8V DC is present on the remote terminal.
- Check if a good ground connection is present. Check all fuses.
- Check if the protection LED is not lit.

## PROTECTION LED ILLUMINATES WHEN AMPLIFIER IS POWERED UP

- Check to see if any speaker wires are short-circuited to the chassis or themselves.
- Remove speaker wires and reset the amplifier. If the protection LED still comes on, then the amplifier is at fault.

## FUSE BLOWING

- Check if the minimum speaker impedance is met.
- Check for short-circuits on power cable and vehicle chassis.

## OVERHEATING

- Check if the minimum speaker impedance is met.
- Check speakers for short-circuits.
- Check if there is good airflow around the amplifier

## SOUND TOO LOW-DISTORTED SOUND

- Check if the input level control is set to match the output level of the source unit.
- Check the head unit's volume.
- Check speakers for short-circuits
- Check if crossover frequencies have been properly set.

## HIGH HISSING NOISE - ENGINE NOISE IN SPEAKERS

- Check if a good ground connection is present. Most engine noises are caused by grounding issues.
- Hissing noise is most often caused by gain issues. Proper gain matching is usually required to eliminate hissing noise.

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The Zapco Z-Series is a joint venture of ARPA of America and ARPA Italy and is manufactured in Korea

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